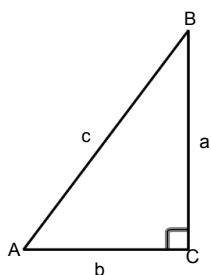


7-5 Apply the Tangent ratio

Side adjacent to $\angle A$ b Side opposite of $\angle A$ a

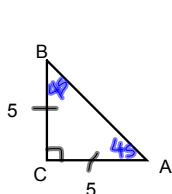
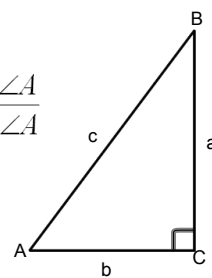
Trigonometry

The tangent ratio

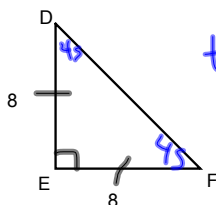
$$\tan A = \frac{\text{side opposite } \angle A}{\text{side adjacent } \angle A}$$

$$\tan A = \frac{a}{b}$$

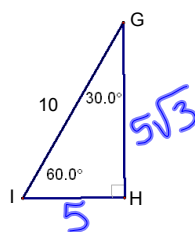
$$\tan B = \frac{b}{a}$$



$$\tan 45 = \frac{5}{5} = 1$$



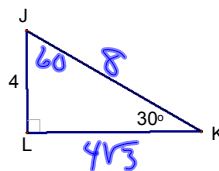
$$\tan 45 = \frac{8}{8} = 1$$



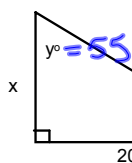
$$\tan 30 = \left(\frac{5}{5\sqrt{3}}\right) \approx .5774$$

$$\tan 30 \approx .5774$$

$$\tan 60 = \frac{5\sqrt{3}}{5} = \sqrt{3} \approx 1.732$$



Every angle has a specific tangent value



$$\tan 35 = \frac{x}{20}$$

$$20 \tan 35 = x$$

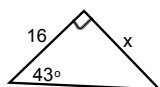
$$x \approx 14.0$$

$$\tan 55 = \frac{20}{x}$$

$$x \tan 55 = 20$$

$$x = \frac{20}{\tan 55}$$

$$x \approx 14.0$$

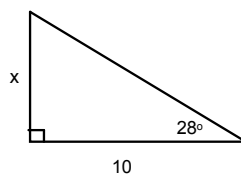


$$\tan 43 = \frac{x}{16}$$

$$14.9 \approx x$$

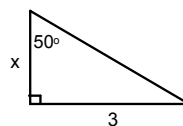
Do:

1.



$$x \approx 5.3$$

2.



$$x \approx 2.5$$

You can also find the angle if you have the legs.

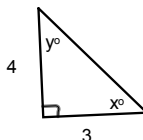


$$\tan x = \frac{2}{2}$$

\tan^{-1}
Inverse tangent

$$\tan^{-1}(1) = x$$

$$45^\circ = x$$



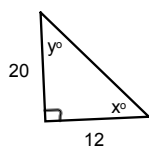
$$\tan x = \frac{4}{3}$$

$$\tan^{-1}\left(\frac{4}{3}\right) = x$$

$$53.1^\circ \approx x$$

$$y = 90 - \text{ANS}$$

$$y \approx 36.9^\circ$$

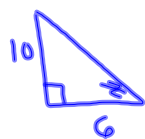


$$\tan x = \frac{20}{12}$$

$$\tan^{-1}\left(\frac{20}{12}\right) = x$$

$$59.0^\circ \approx x$$

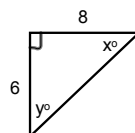
$$31.0^\circ \approx y$$



$$\tan z = \frac{10}{6}$$

$$\tan^{-1}\left(\frac{10}{6}\right) = z$$

$$59.0^\circ \approx z$$



Do:

